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ABSTRACT

Research has shown contradictory results on the relationship of infant attachment security to play and mastery behavior, at times predicting the cognitive quality of play and at other times predicting the affective quality of play. In order to test the hypotheses that, during play, attachment security would predict only positive affect, temperamental differences would predict negative affect, and maternal intelligence would predict the amount of symbolic representation, an investigation was conducted of 102 mother-toddler pairs from urban low-income families. Toddlers were 40% black and 60% male and were assessed with respect to free play and attachment security in visits at 12 months and again at 18 months. Additional evaluations were conducted of maternal teaching sensitivity at 12 months and the quality of the home environment at 15 months, while at 24 months mothers were tested to estimate their intelligence. Results of the study included the following: (1) toddlers with secure attachments showed more positive affect at 12 months, but there were no differences in positive affect observed at 18 months; (2) with respect to temperamental differences, low-reactive toddlers showed less negative affect during play and no differences in play level at 12 months only, while by 18 months they were playing less at low levels of non-symbolic play; and (3) the relation between maternal intelligence and symbolic representation depended on age and gender, with representation increasing with maternal intelligence for girls only. Six tables of findings are included. Contains 14 references. (AC)

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Society for Research in Child Development, New Orleans, March, 1993

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SYMPOSIUM: **TODDLERS' ATTENTION TOWARDS PERSONS AND OBJECTS DURING MASTERY PLAY: DEVELOPMENTAL CHANGES AND CORRELATES**

PRESENTATION: **MATERNAL AND TODDLER CORRELATES OF BEHAVIOR DURING FREE PLAY AT 12 AND 18 MONTHS**

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The ability of infants and toddlers to separate from their caregiver and engage in object exploration with competence and pleasure depends on a host of contributing factors, including infant temperament, attachment security, and cognitive ability, as well as parental encouragement to explore and learn. Data indicate that infants who are temperamentally more fearful or inhibited, infants who are anxious about caregiver psychological availability, infants with poorer information processing and attention focusing skills, and infants who experience unstimulating, unresponsive caregiving score poorer on measures of curiosity, exploration, and/or affect during play (see Maslin & Spieker, 1990; Vondra & Jennings, 1990; Wachs, 1987). It is rare, however, for more than one of these predictive factors to be explored in a single study of infant play, and even rarer for play data to be collected at more than one point in time. Furthermore, the vast majority of studies on infant and toddler play have sampled only relatively small numbers of white infants from middle-class families, limiting normative variance in predictor variables and thus potentially biasing correlational findings.

Of the studies conducted to date, there is least consistency in findings relating infant attachment security with play and mastery behavior. In some cases, attachment security has been found to predict cognitive quality of play (Belsky, Garduque, & Hrncir, 1984; Slade,

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1987), in others, affective quality during play or mastery tasks (Matas, Arend, & Sroufe, 1978). In both cases, however, contradictory results have been notable (Frodi, Bridges, & Grolnick, 1985; Harmon, Suwalsky, & Klein, 1979; Maslin & Spieker, 1990). This inconsistency may result from a confound between attachment and temperament in attachment classifications. Data indicate that early physiological and emotional self-regulation (i.e., temperament) play a role in shaping the particular pattern of relationship security (B1/B2 versus B3/B4) expressed when caregiving is attuned to infant psychological needs, and the pattern of insecurity (A versus C) expressed when caregiving is unresponsive and insensitive (Belsky & Rovine, 1987; Frodi & Thompson, 1985). Since infant temperamental differences also appear to contribute to early object and social orientation (Matheny, 1980; Wilson, 1983), the inconsistency of data relating attachment and mastery play is not surprising.

Aspects of play behavior and play quality associated with attachment security are likely to differ from those associated with temperament and also from those associated with cognitive stimulation and infant cognitive functioning. Based on studies of the correlates of play among infants, it was hypothesized that attachment security (B versus A,C, or D classification) would predict only the amount of **positive affect** expressed during independent free play, that is, how much the infant can enjoy object exploration with mother present in the room. In contrast, temperamental differences expressed in attachment patterns (A1-B2 versus B3-C2 classifications) would predict **negative affect** during play, amount of social versus object orientation (**time with mother** versus time with toys), and more non-symbolic **object manipulation**. These are all likely to show effects of behavioral inhibition and/or negative reactivity to unfamiliar situations like a lab assessment. Maternal intelligence (as a proxy for infant cognitive ability) would predict the amount of **symbolic representation**

during play (particularly after 12 months in a low-SES sample, when symbolic representation is more likely to be seen), and maternal support for cognitive development would predict the amount of **higher- versus lower-level play**. Gender differences in these relations were also predicted, based on previous work.

METHODS

Data for this investigation were collected on 102 mother-toddler dyads from urban, low-income families. Approximately 40% of the toddlers are black, 60% are male, and 50% are insecurely attached. Toddlers were observed with their mothers during laboratory visits at 12 months and again at 18 months, each of which times toddler free play (15 minutes) and toddler attachment security (Strange Situation) were assessed. In addition, maternal teaching sensitivity during four tasks was assessed at 12 months and the quality of the home environment was evaluated in the home at 15 months. Finally, at 24 months, mothers were given two subscales of the WAIS during a lab visits to estimate their intelligence.

Attachment classifications were used in two different ways: first, as an indicator of security (infants were categorized as secure of insecure) and second, as an indicator of a negatively reactive temperament (A1, A2, B1, and B2 classifications were categorized as low on negative reactivity; B3, B4, C1, and C2 classifications were categorized as high on negative reactivity). Maternal support was measured in terms of Ainsworth's sensitivity and cooperation ratings during the teaching tasks at 12 months and in terms of the total score on a measure of the home environment at 15 months.

Play data were computer-scored on a continuous basis at 12 and 18 months using the Belsky and Most (1981) play scale. The total frequency (in seconds) of play acts at each of three broad levels of cognitive sophistication (rudimentary manipulation, or **low-level play**,

transitional or **medium-level play**, and symbolic or **high-level play**) was computed. In addition, a sum of all play (in seconds), weighted for its cognitive level, was computed (Hrncir, Speller, & West, 1985). Finally, total number of seconds within arms reach of mother, and second of positive and negative affect during the play session were also scored.

RESULTS

Before testing each hypothesis at 12 and 18 months, stability of play was examined across that time period. Table 1 presents these data. For the most part, there was very little stability in play measures over six months, although in some cases this was due to gender differences. Boys showed somewhat more stability in their play and affect than girls did. In all cases, however, there was developmental **change** in play. Low-level manipulative play decreased from 12 to 18 months ($F[1,91] = 102.69$, $p < .001$), whereas transitional manipulative play and symbolic representation both increased over the same time period ($F[1,91] = 63.42$, $p < .001$ and $F[1,91] = 17.02$, $p < .001$, respectively).

The first hypothesis, that attachment security would predict **only** positive affect during play was confirmed at 12 months only. Data appear in Table 2. Twelve-month-olds with secure attachments showed more positive affect at 12 months, but there were no differences in positive affect observed at 18 months. Rather, attachment and gender together predicted **symbolic representation** in play. Secure boys and insecure girls showed more high-level--or symbolic--play at 18 months. This kind of attachment by gender interaction in play quality was also reported by Popper and her colleagues and, in their case, it differed in direction depending on whether the focus was independent exploration or exploration involving the mother. So, in this low-income sample, security and positive affect were associated only at

one year. Once symbolic representation began to emerge more consistently, at 18 months in this sample, the association with attachment security shifted to symbolic representation.

A very similar result emerged for toddler negative reactivity. Data appear in Table 3. Low-reactive toddlers (As and B1/B2s) showed less **negative affect** during play, but only at 12 months. In contrast, no differences in **play level** were associated with negative reactivity at 12 months. But by 18 months, low-reactive toddlers were playing less at low levels and more at medium levels of non-symbolic play. So, again, the affect difference was observed only at 12 months, the play-level differences was observed only at 18 months. However at both ages, low-reactive infants spent less play time with their mother. Once again, therefore, the hypothesis was confirmed overall.

Thus, attachment classification as an indicator of negative reactivity and as an indicator of relationship security predicted quite different aspects of play behavior. **Security** predicted positive affect and (with gender) symbolic representation, whereas **negative reactivity** predicted negative affect, time with mother, and non-symbolic play, depending on the age of the toddler.

The third hypothesis, that maternal intelligence would predict symbolic representation, also depended on the age and gender of the child. Data appear in Table 4. Like attachment security, intelligence predicted symbolic representation only at 18 months, and then the relation depended on child gender. In this case, the relation held for girls but not boys. As maternal (and presumably toddler) intelligence increased, girls only showed less low-level play and more symbolic representation during the play session. Comparing the predictive value of attachment security versus IQ in a separate analysis revealed that the **IQ** by gender

effect was somewhat more robust, but that both IQ and attachment security contributed uniquely to the prediction of play.

The only hypothesis to receive no support was that involving maternal caregiving. Data appear in Table 5. Neither sensitivity or cooperation in teaching tasks at 12 months, nor quality of the home environment at 15 months, related to measures of play in the predicted direction. In fact, very modest correlations in the **opposite** direction from those predicted emerged at 18 months. A home environment that was more developmentally supportive predicted more **low**-level play and less **medium**-level play at 18 months. The same pattern of greater low-level play and less medium- or high-level play was observed for maternal cooperation at 12 months and play by boys and for maternal sensitivity at 12 months and play by girls. In this sample, higher quality maternal care measured **outside** the play assessment was associated with toddler play of less cognitive sophistication.

Finally, gender differences were found both at 12 and 18 months. These data appear in Table 6. As reported earlier, play measures for boys showed somewhat more stability over time than play measures for girls. In addition, at both 12 and 18 months, boys used more medium-level non-symbolic play than did girls. But by 18 months, girls were using more symbolic representation in their play and scored higher, overall, on the weighted play measure than did boys. Gender interaction effects relating to IQ and to attachment security were already reported earlier. In summary, there were a variety of different gender effects that emerged across toddlerhood in this low-income sample, effects that are probably a result of both group differences in such factors as activity level and behavioral tempo as well as gender socialization.

CONCLUSIONS

This study is relatively unique in its emphasis on **multiple** factors that contribute to differences in early play, as well as in its use of an ethnically diverse, lower-income sample. The factors of toddler attachment security, temperament, gender, and cognitive ability, as well as maternal caregiving, each contributed to the prediction of toddler free play, but in rather unique and sometimes complex ways. Clearly this is an outcome of the fact that play quality is not simply the result of individual differences in cognitive functioning and mastery motivation, but in early differences in experiences and in willingness to separate and explore as well. Whether early play is to be used as a measure of cognition or a measure of motivation to explore and master, it is important to take this multiple perspective into account.

Toddlers who have negative emotional reactions to the new and unfamiliar will tend not to feel as comfortable playing independently in unfamiliar circumstances, yet their discomfort and its effects on their play may not reflect **either** mastery motivation or cognition. Toddlers who are insecure in their relationship with their caregiver may enjoy themselves less in a variety of activities and settings which include that caregiver and, depending on their socialization experiences, may express that lack of enjoyment through less use of higher-level cognitive skills, ultimately a motivational effect. Toddlers who inherit lower intelligence may be slower in acquiring and less sophisticated in using forms of play that require emerging cognitive skills, an obvious example of cognitive influences. And finally, male and female toddlers may experience and interact with their world differently as a result both of genetic and socialization differences. This could affect both the cognitive and motivational aspects of early play.

If we are to use individual differences in play during infancy and toddlerhood as indices of motivation and cognition, it is important to recognize the complex interplay of these multiple influences on play behavior. Otherwise, we run the risk of misinterpreting and/or overinterpreting both the patterns **and** lack of patterns found when play data are examined from only one perspective. It seems clear that many of the inconsistencies in findings across studies on early play reflect a failure to consider all of the different influences that act on play, as much as they reflect all of the variation in meaning that different measures of play behavior hold. There is need for more integration of methods, measures, and findings across studies that use play to study cognition or motivation. After all, attention, information processing, symbolic representation, motivation to explore, temperament, and gender are all, by nature, very much integrated when it comes to creating differences in early play behavior.

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TABLE 1

STABILITY OF PLAY AND AFFECT FROM 12 TO 18 MONTHS (N = 93)

Low-Level Play:	N.S. BOYS = .28* GIRLS= .01	Time With Mother:	N.S.
Medium-Level Play:	.23* BOYS = .34* GIRLS= -.03	Positive Affect:	N.S.
High-Level Play:	N.S.	Negative Affect:	.21* BOYS = .57*** GIRLS= -.06
Weighted Sum of Play:	N.S.		

TABLE 2

HYPOTHESIS 1: SECURITY PREDICTS ONLY POSITIVE AFFECT

12 MONTHS

Confirmed: F(1,97)=5.20*

Infants with secure attachments show more positive affect (13 seconds) than infants with insecure attachments (8 seconds).

18 MONTHS

Disconfirmed: No Main Effects of Security on Positive Affect

Two Gender X Security Interaction Effects:
High-Level Play (F[1,87]=9.63**)
Weighted Sum of All Play (F=6.28*)

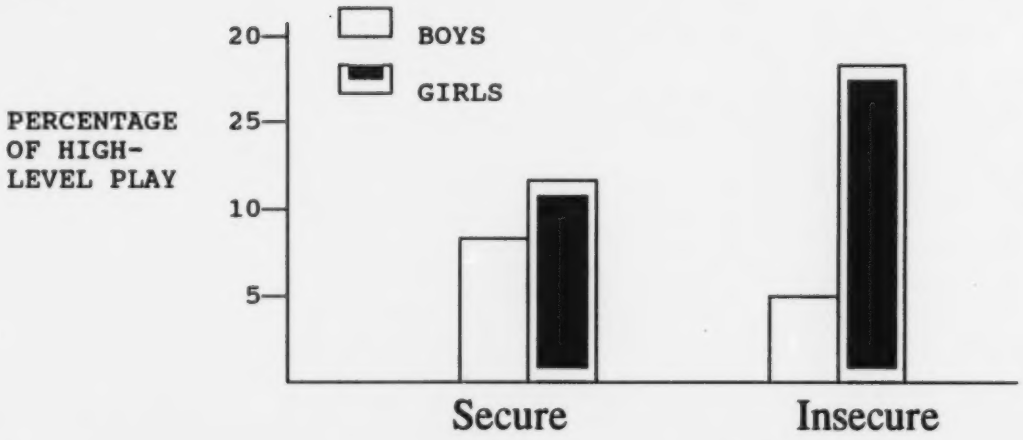

TABLE 3
HYPOTHESIS 2: TEMPERAMENT PREDICTS NEGATIVE AFFECT, TIME WITH MOTHER, AND MORE NON-SYMBOLIC PLAY

12 MONTHS

Confirmed for Negative Affect:
$F(1,97) = 4.75^{*}$

Low reactive infants show less negative affect (1 second) than high reactive infants (15 seconds).

Confirmed for Time With Mother:
$F(1,97) = 10.36^{**}$

Low reactive infants spend less play time with mother (10%) than high reactive infants (20%).

Disconfirmed for Non-Symbolic Play

No differences in play observed.

18 MONTHS

Disconfirmed for Negative Affect

Confirmed for Time With Mother:
$F(1,86) = 14.15^{***}$

Low reactive infants spend less play time with mother (14%) than high reactive infants (30%).

Confirmed for Some Non-Sym Play:
Low-Level Play ($F[1,86] = 17.93^{***}$)
Med-Level Play ($F[1,86] = 15.12^{***}$)
Sum of All Play ($F[1,86] = 5.73^{*}$)

Low reactive infants show <u>less</u> low-level play, but <u>more</u> medium-level play and total weighted play.

TABLE 4
HYPOTHESIS 3: MATERNAL IQ PREDICTS AMOUNT OF SYMBOLIC REPRESENTATION IN PLAY (ESPECIALLY AFTER 12 MONTHS)

12 MONTHS

Disconfirmed: No main effects for IQ

18 MONTHS

Disconfirmed: No main effects for IQ

But: Gender X IQ Interaction effects for all levels of play:

Low-Level Play ($F[2,81] = 4.35^{*}$)
Med-Level Play ($F[2,81] = 3.92^{*}$)
Hi-Level Play ($F[2,81] = 5.91^{**}$)
Weighted Sum ($F[2,81] = 4.02^{*}$)

TABLE 5

HYPOTHESIS 4: MATERNAL SUPPORT PREDICTS AMOUNT OF HIGHER-LEVEL PLAY

12 MONTHS	18 MONTHS
Disconfirmed: No relation between maternal behavior during teaching tasks and any play measure.	**Disconfirmed:** Somewhat more low-level play (r = .22*) and less medium-level play (r = -.22*) with higher HOME score (15 months).

TABLE 6

HYPOTHESIS 5: GENDER DIFFERENCES IN PLAY BEHAVIOR WILL BE FOUND

12 MONTHS

Confirmed for Medium-Level Play:
F(1,97) = 9.55**

Boys use more medium-level play than girls do.

Confirmed for 12-18 mos. Stability:

Boys show somewhat more stability over time in play than girls do.

18 MONTHS

Confirmed for Medium-Level Play:
F(1,87) = 5.94*

Boys use more medium-level play than girls do.

Confirmed for High-Level Play:
F(1,87) = 8.54**

Girls use more high-level play than boys do.

Confirmed for Weighted Sum of Play:
F(1,87) = 4.28*

Girls score higher, overall, on play than boys do.